

## Concept for an Origins Probe of Interstellar Magnetic Fields and Dynamics

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We describe a mission concept, recently proposed to NASA for further study, that probes the formation of stars and the life cycle of the Galaxy and nearby galaxies. The Galactic Life Cycle Observatory (GLCO) is a survey mission of two key components of galactic structure and dynamics: (1) molecular hydrogen “hidden” in clouds partially shielded from interstellar radiation, and absent in traditional surveys such as CO and HI, and (2) the magnetic field structure of neutral interstellar clouds. We cannot understand the formation of stars in galaxies, near and far, without a clear picture of the role of magnetic fields and the un-surveyed molecular hydrogen. GLCO addresses this issue with surveys of dust polarization at 50 to 200  $\mu\text{m}$ , and spectrally-resolved C+ 158  $\mu\text{m}$  emission, with a 1 m telescope at L2. No mission in operation or development carries out surveys in these important tracers.